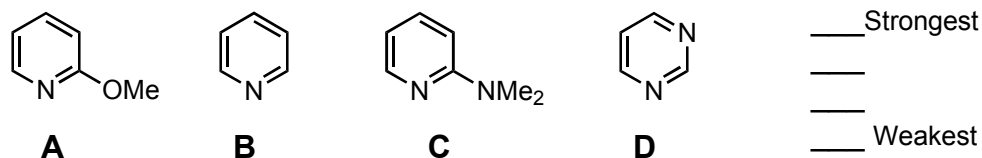
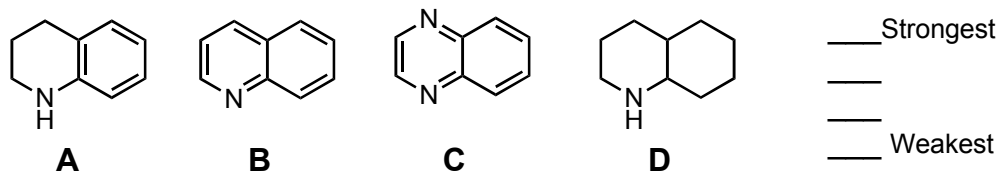


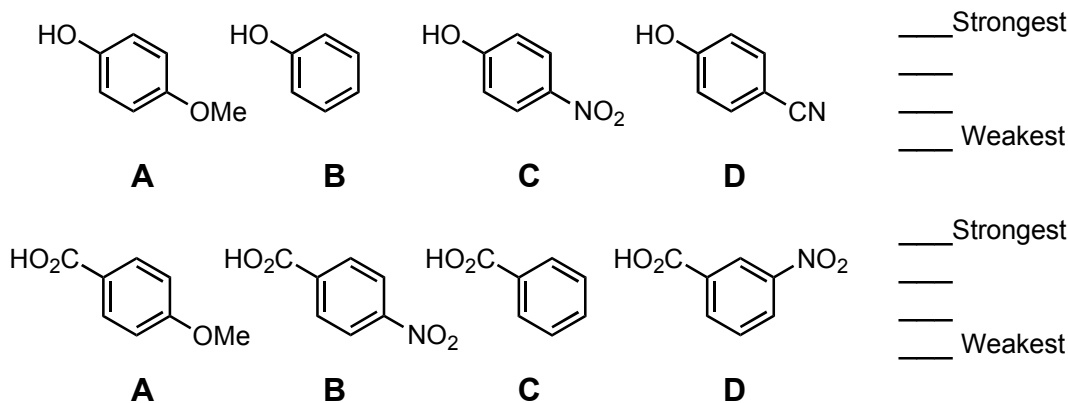
I: Bronsted-Lowry Acids-Bases

1. In the two questions below you are asked to rank the relative strengths of the series of illustrated acids and bases. Use your knowledge of resonance and inductive effects to answer this question.

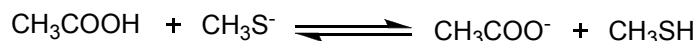
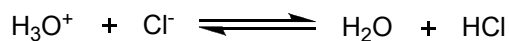
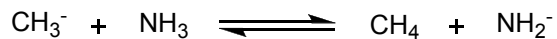
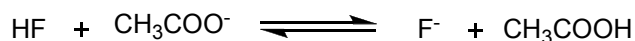
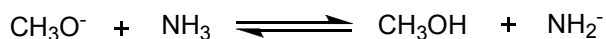
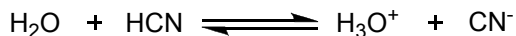
Part A: For the series of bases shown below, rank the set from strongest to weakest.



Part B: For the series of acids shown below, rank the set from strongest to weakest.



2. (i) Determine whether each species in the following equations is acting as a Bronsted acid or base, and label it. (ii) Indicate whether the equilibrium lies to the left or the right. (iii) Estimate K for each reaction if possible. (**Hint:** Use the Evan's pKa Table)[†]



3. Write the for the conjugate base of each of the following acids.[†]

(a) H_2SO_3 ; (b) HClO_3 ; (c) H_2S ; (d) $(\text{CH}_3)_2\text{OH}^+$; (e) HSO_4^-

4. Write the for the conjugate acid of each of the following bases.[†]

(a) $(\text{CH}_3)_2\text{N}^-$; (b) S^{2-} ; (c) NH_3 ; (d) $(\text{CH}_3)_2\text{C}=\text{O}$; (e) $\text{CF}_3\text{CH}_2\text{O}^-$

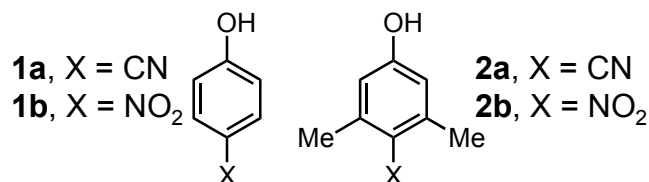
II: Lewis Acids-Bases

5. Identify each of the following species as either a Lewis acid or Lewis, and write an equation illustrating a Lewis acid-base reaction for each one. Use curved arrows to depict electron-pair movement. Be sure that the product of each reaction is depicted by a complete, correct Lewis structure.[†]

(a) CN^- ; (b) CH_3OH ; (c) MgBr_2 ; (d) $(\text{CH}_3)_2\text{OH}^+$; (e) CH_3BH_2 ; (f) CH_3S^-

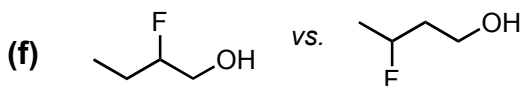
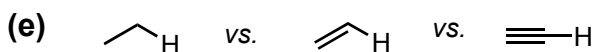
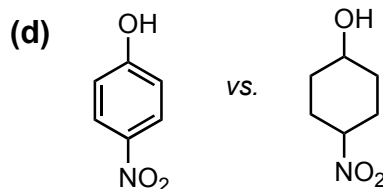
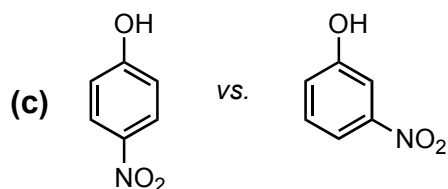
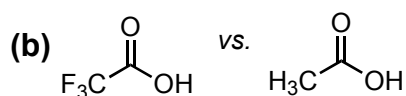
III: Acid-Base / Resonance Theory

6. The acidity of **1a** and **2a** are the same; however, **1b** is a significantly stronger acid than **2b**.



Explain these observation. (Note: A picture is worth a thousand words)

7. Compare the relative acidity of the following sets of organic compounds. Which is more acidic? Why? (be specific)



[†]Adapted from Vollhardt & Shore